

Figure 1 FCPA block diagram

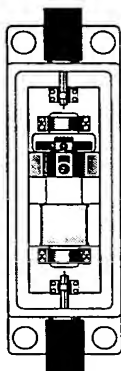
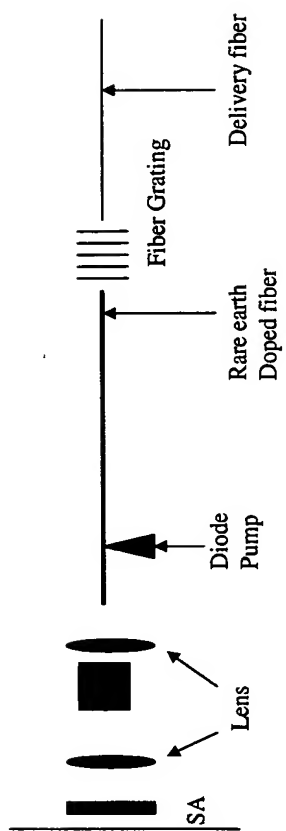


Fig. 1A

Fig. 1B

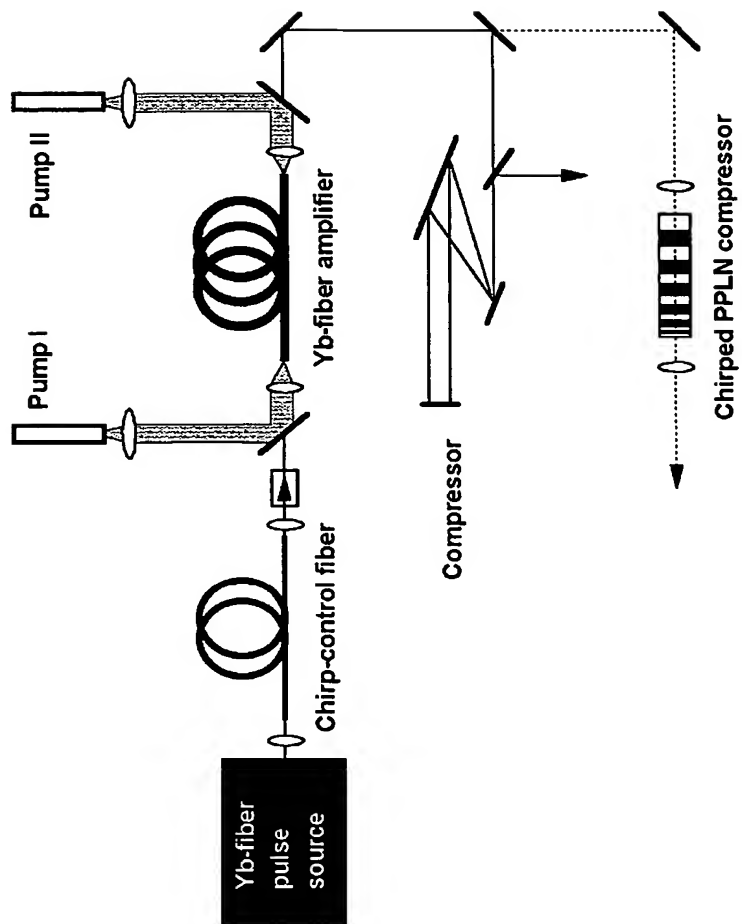


Fig. 1B

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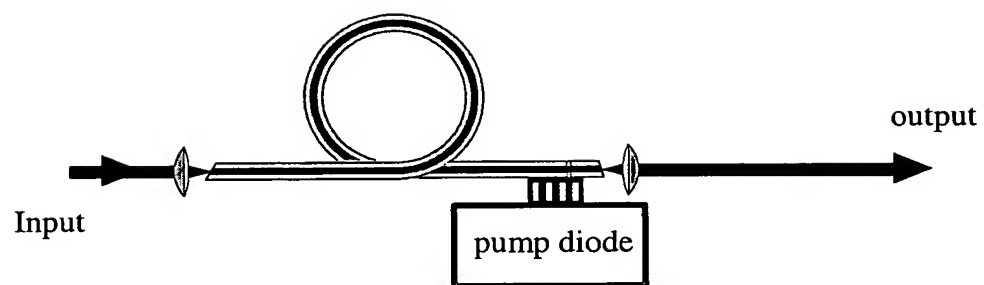
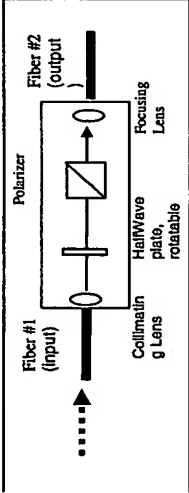


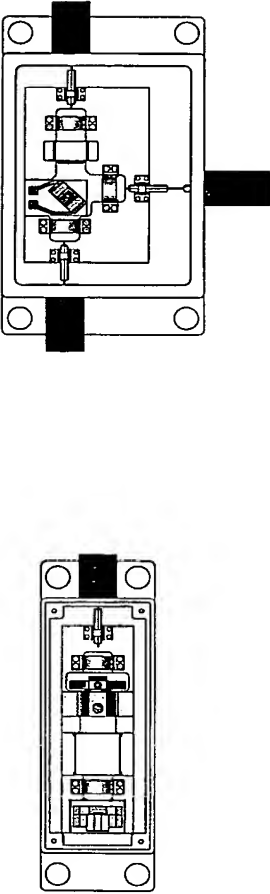
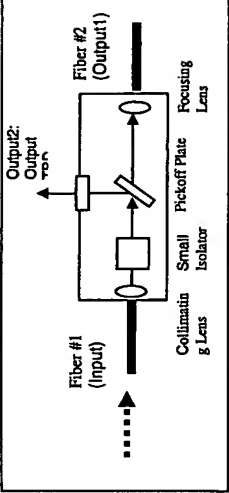
Fig. 1C

Figure 2 Outline Dimensions of two Typical Module Packages

Attenuator Module



Pigtailed Tap Points



Attenuator Module package: length, width & height: 40.1mm x 12.7mm x 9.11mm

Pigtailed Tap Points package: length, width & height: 39.1mm x 22.7mm x 10.11mm

For comparison, the outline dimensions for a standard 14pin butterfly package : 30.0mm x 12.7mm

**Fig. 3 Optical Layout for Down counter module**

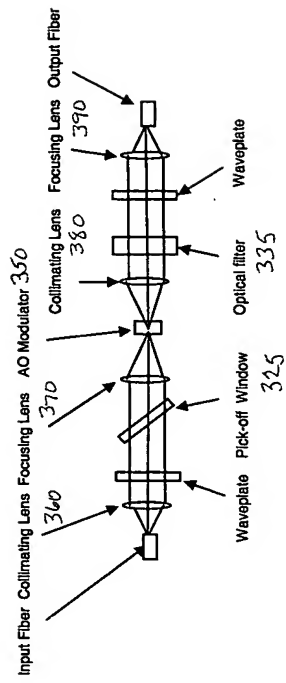
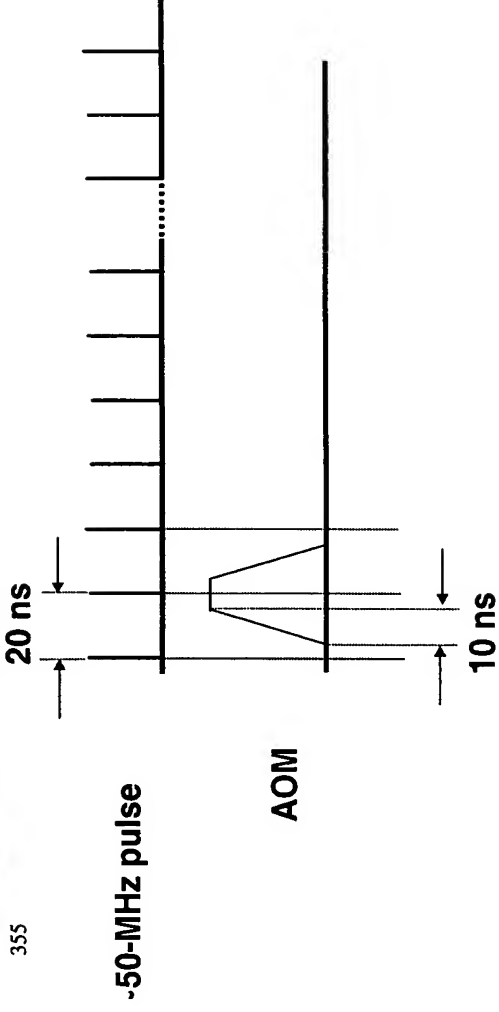
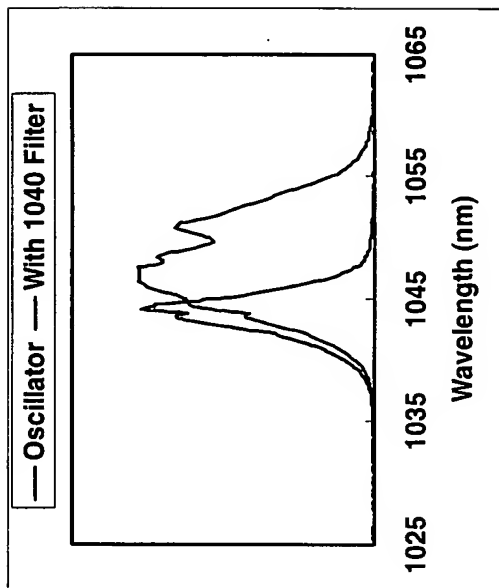


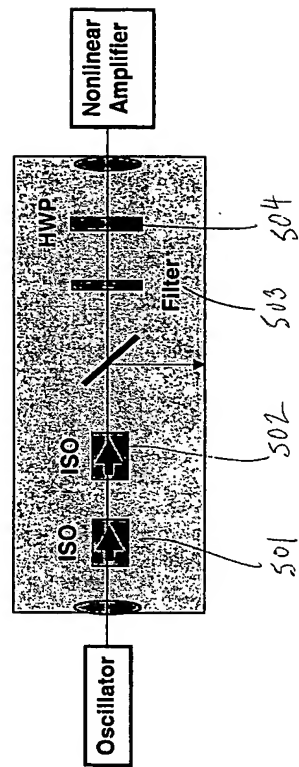
Fig. 4 Temporal performance of down counter

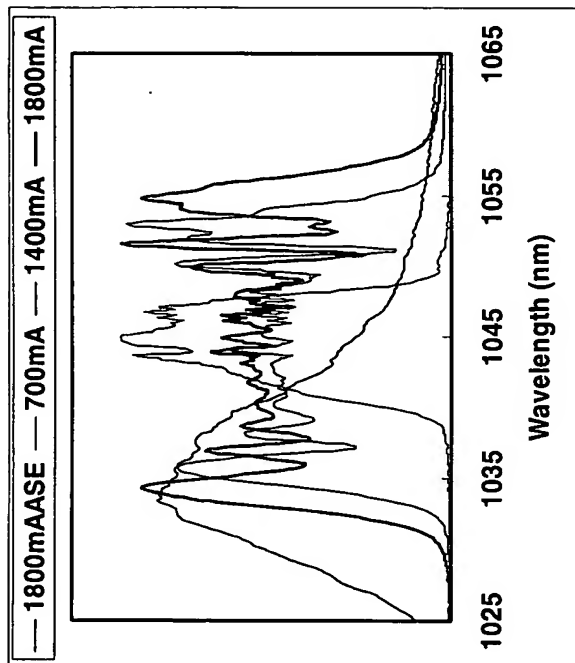


For 50-MHz pulse train, the rise time of 10 ns of AOM is desirable

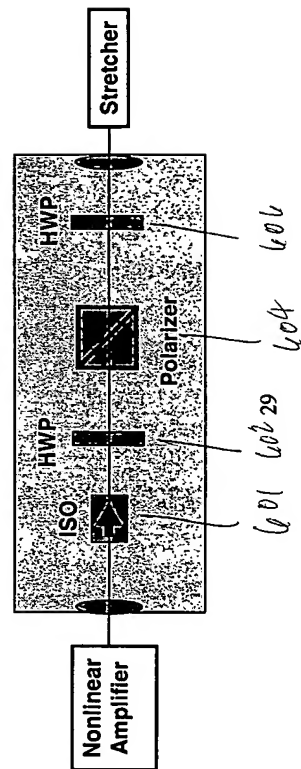


**Fig. 5 (a) Spectrum from oscillator and after first filter, isolator and attenuator module. (b) Component illustration of filter, isolator and attenuator module.**

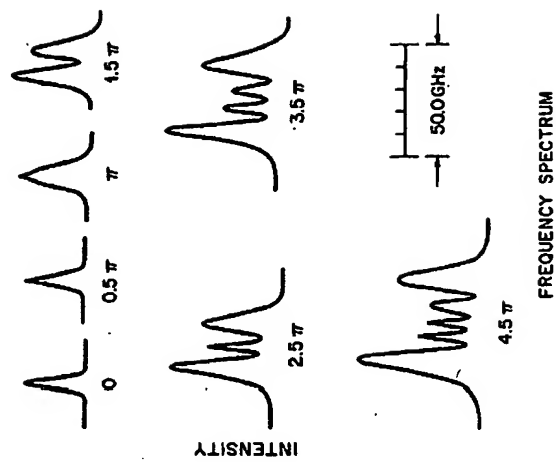




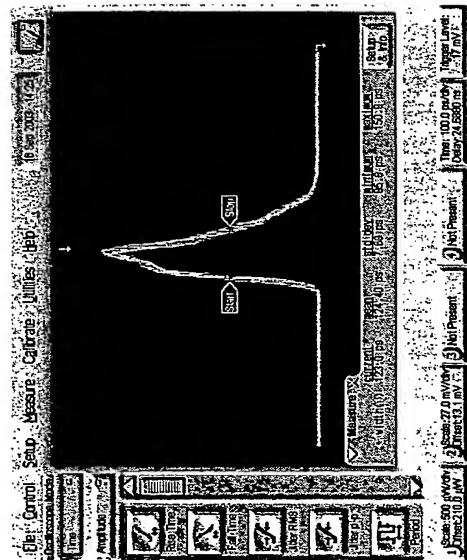
**Fig. 6a Spectrum from nonlinear amplifier as a function of pump diode current and ASE spectral output at peak current. (b) Component illustration of isolator – attenuator module between nonlinear amplifier and stretcher.**



**Fig. 7 Spectrum of pulses with self-phase modulation propagating in a positive dispersion fiber.**

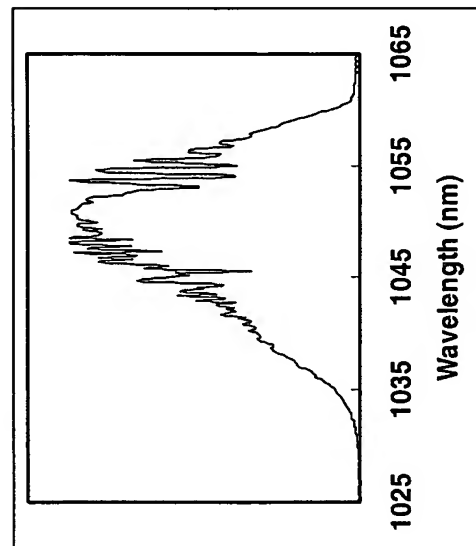


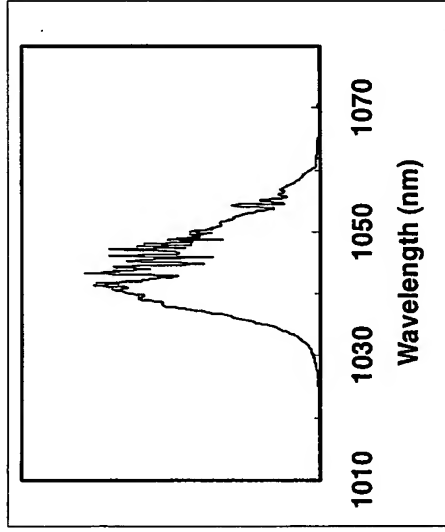
**Fig. 4.3** Experimentally observed spectra for a nearly Gaussian pulse at the output of a 99-m-long fiber. Spectra are labeled by the maximum phase shift  $\phi_{\max}$  related linearly to the peak power (after Ref. 9).



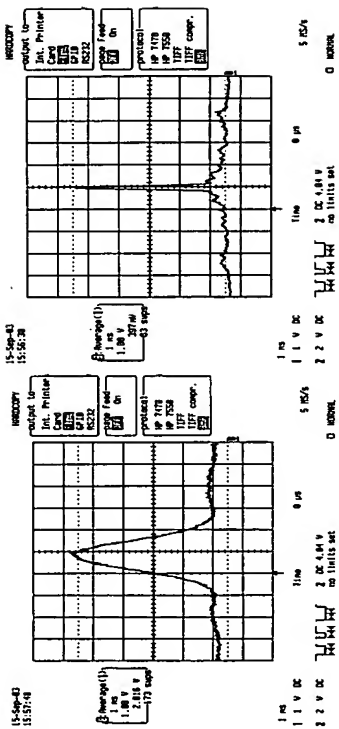
375

380 Fig 8 Temporal (a) and spectral (b) profile of the pulse  
after stretcher



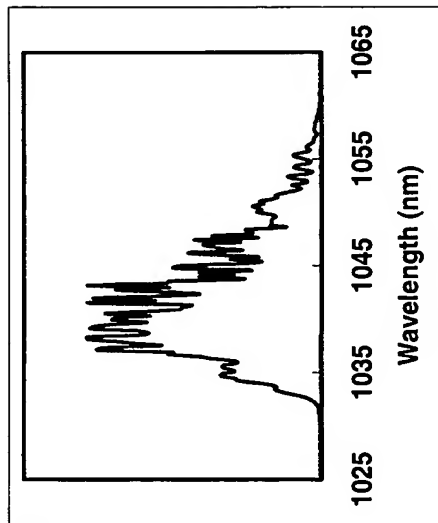


**Fig. 9 - Spectrum after power amplifier**



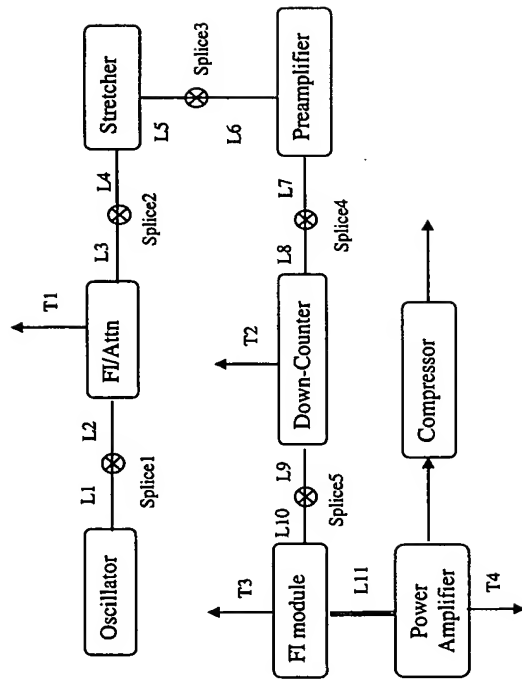
390

Figure 10 - Auto correlations of output pulse (a) 5 ps range (b) 50 ps range. (c) Spectrum of output



395

Figure 11 FCPA block diagram (second embodiment)



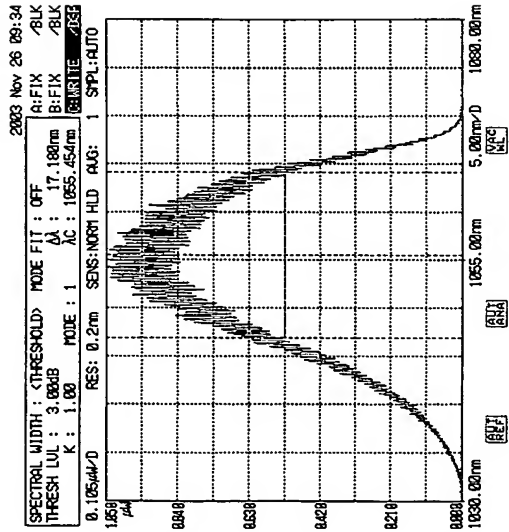
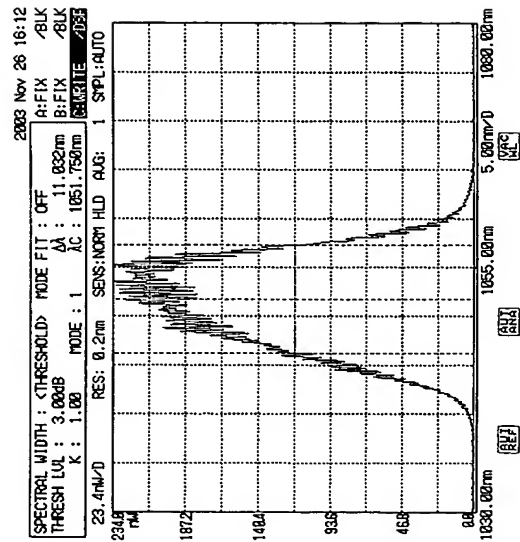


Figure 12 (a) Spectrum from oscillator (b) Spectrum after

400 filter module.



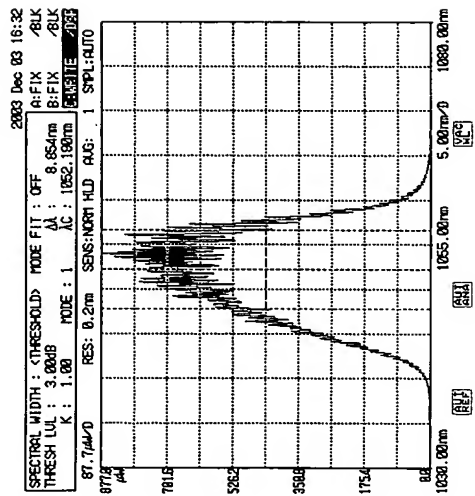
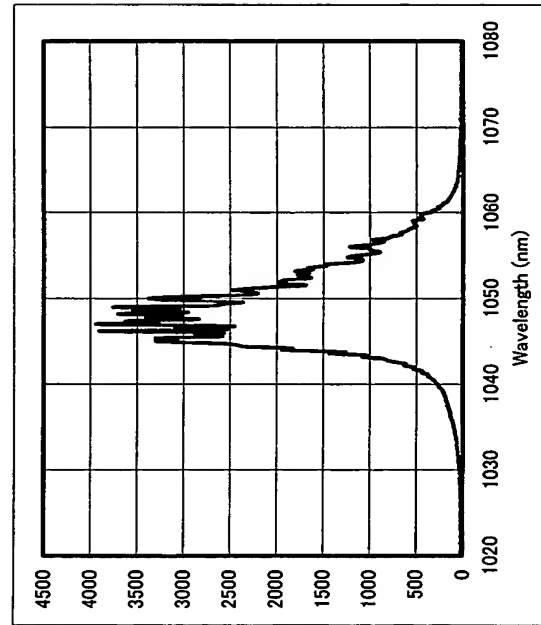
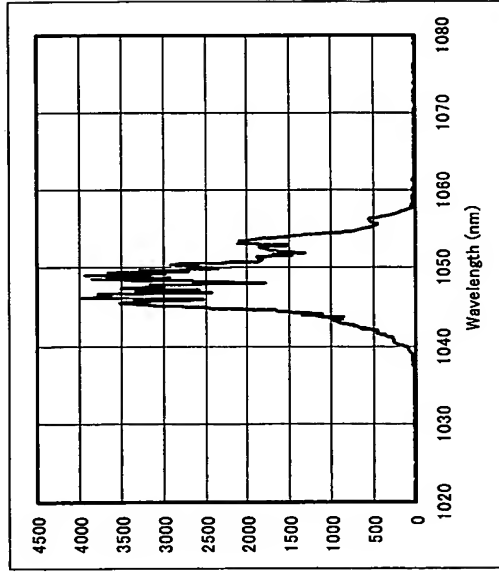


Figure 13 (a) spectrum after preamplifier (b) after power amplifier.

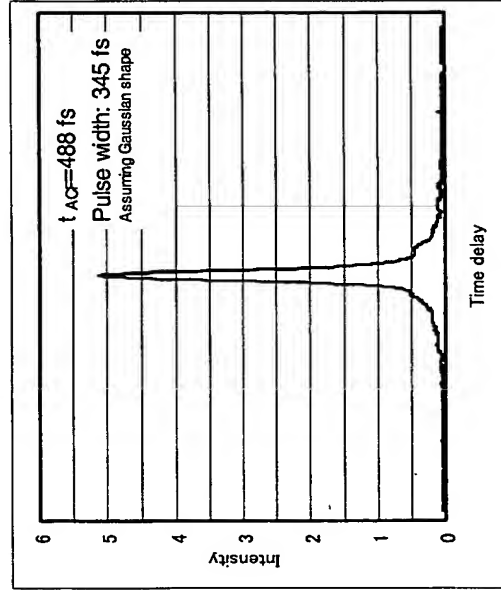
405





**Figure 14(a) Spectrum after compressor and (b)**

410 autocorrelation of compressed pulse.



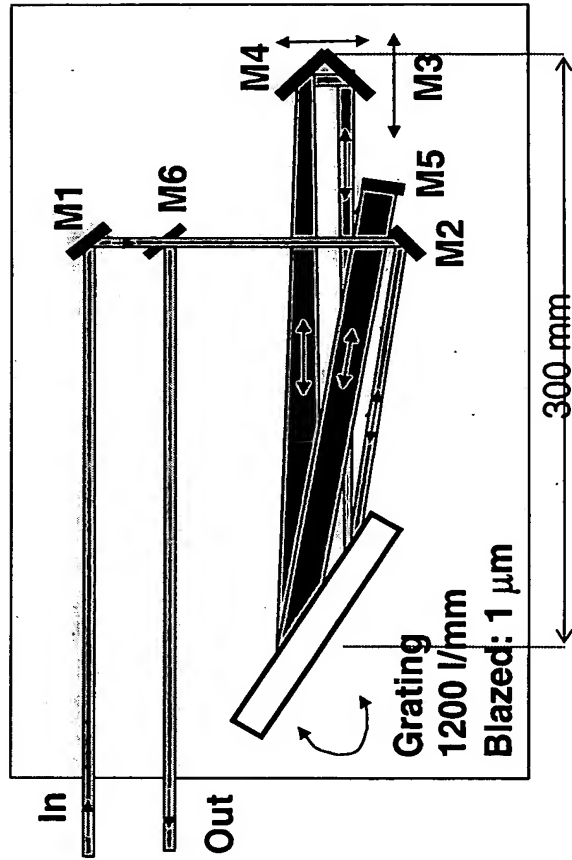
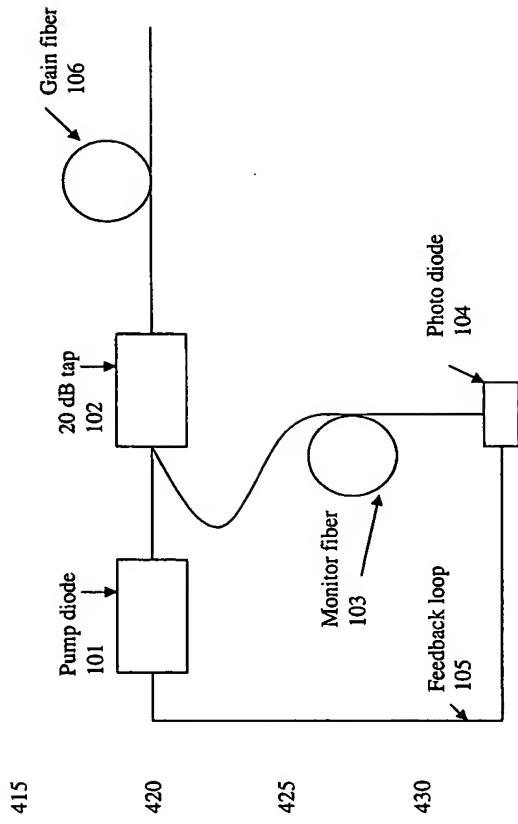
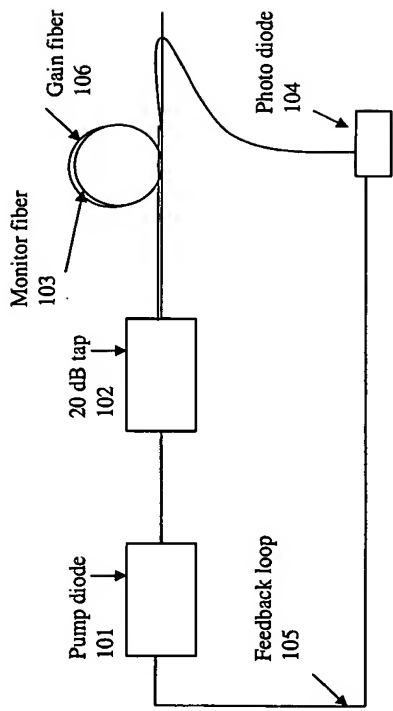


Fig. 14c

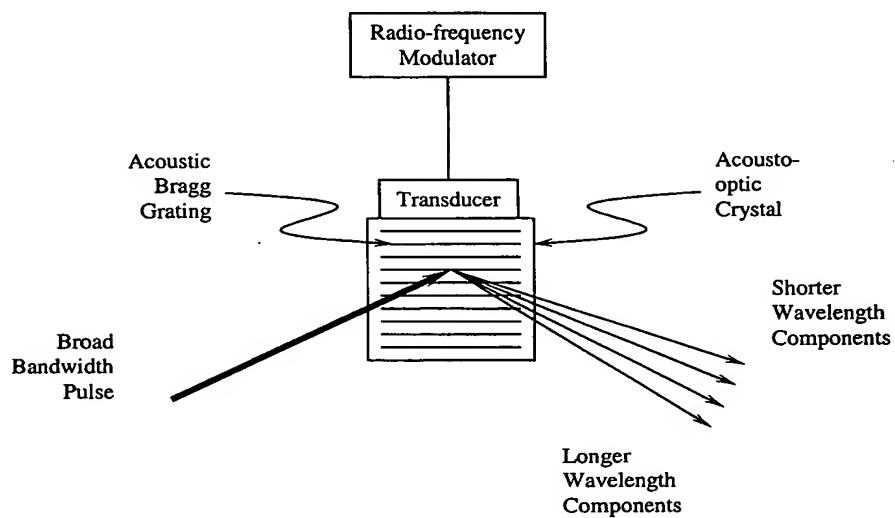


**Fig. 15**

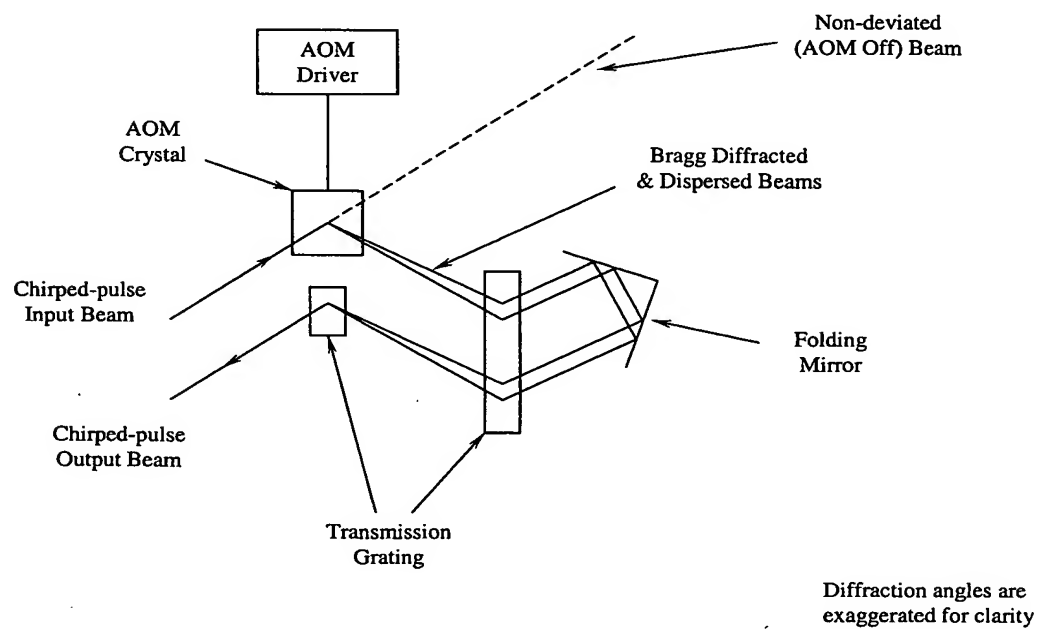


**Fig. 16**

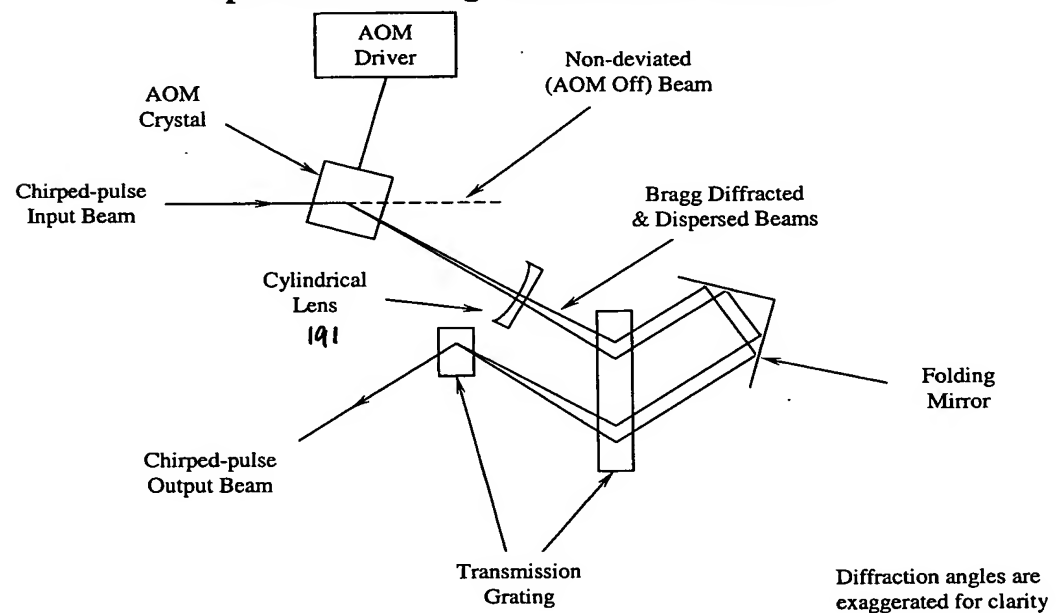
**Fig 17 Acousto-optic Deflector Illustrating Dispersive Characteristic of Induced Bragg Grating**



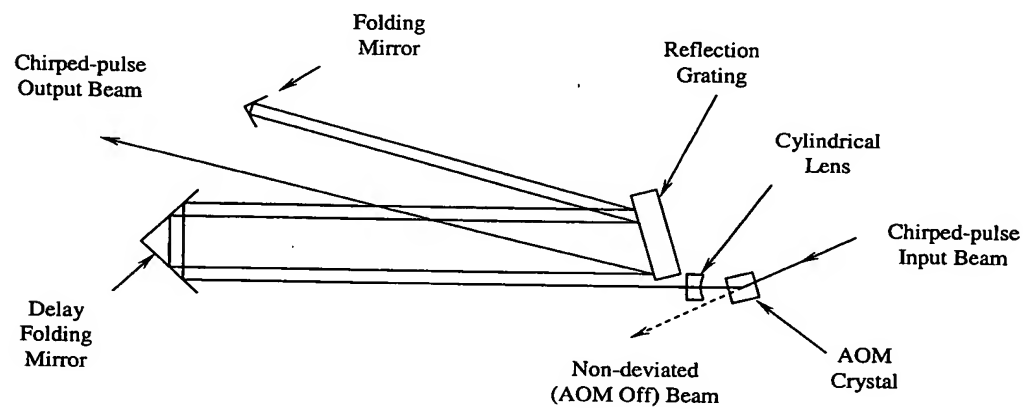
**Fig. 18 - Rudimentary Two-pass Chirped-pulse Dispersion-compensated Acousto-optic Switch using Transmission Gratings**



**Fig. 19 - Lens-enhanced Two-pass Chirped-pulse Dispersion-compensated Acousto-optic Switch using Transmission Gratings**



**Fig. 20 - Lens-enhanced Four-pass Chirped-pulse Dispersion-compensated Acousto-optic Switch using a Reflection Grating**



Only central ray  
shown for clarity